CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
November 27, 2014

Prepared by
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CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for November 27, 2014 07:00 to November 28, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for carbon dioxide (CO), chlorine (Cl_2), hydrogen sulfide (H_2S), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), particulate matter (10-micron particles, PM_{10}), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems© AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S, and SO_2. Table 2 summarizes monitoring data for AreaRAE monitoring. The LEL detections reported at AreaRAE Units 01 and 02 were identified as confirmed sensor drift by CTEH® personnel using a secondary instrument. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Additional particulate monitoring was conducted around the facility perimeter within the work area. TSI AM510 SidePak aerosol monitors equipped with 10-micron impactors were collocated with the AreaRAE units. Table 3 summarizes monitoring data for data-logged AM510 units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
November 27, 2014 07:00 – November 28, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Community	Cl_2	MR+ / MR Pro	17	0	NA	<0.1 ppm
	CO	MR+ / MR Pro	4	0	NA	<1 ppm
	H_2S	MR+ / MR Pro	4	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	24	0	NA	<1 %
	O_2	MR+ / MR Pro	18	18	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	21	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	15	15	0.0104	0.004 - 0.055 mg/m^3
	SO_2	MR+	19	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	20	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	20	0	NA	<0.1 ppm
Exclusion Zone	Cl_2	Gastec 8La	2	0	NA	<0.05 ppm
		MR+ / MR Pro	3	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	7	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	7	0	NA	<1 %
	O_2	MR+ / MR Pro	6	6	20.9	20.9 - 20.9 %
	SO_2	MR+	4	0	NA	<0.1 ppm
	VOC	MR+ / MR Pro	8	1	0.5	0.5 - 0.5 ppm
Work Area	Cl_2	Gastec 8La	3	0	NA	<0.05 ppm
		MR+ / MR Pro	21	0	NA	<0.1 ppm
	CO	MR	1	0	NA	<1 ppm
	H_2S	MR+ / MR Pro	28	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	15	0	NA	<1 %
	O_2	MR+ / MR Pro	10	10	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	12	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	1	1	0.007	0.007 - 0.007 mg/m^3
	SO_2	MR+	5	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	12	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	25	0	NA	<0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 2: AreaRAE Air Monitoring Summary[1]
November 27, 2014 07:00 – November 28, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Unit 01	H_2S	5339	607	0.2 ppm	0.1 - 0.8 ppm
	LEL	5339	17	0.03	3.0 - 3.0 %
	SO_2	5339	23	0.1 ppm	0.1 - 0.1 ppm
	VOC	5339	24	0.1 ppm	0.1 - 0.2 ppm
Unit 02	H_2S	5370	408	0.2 ppm	0.1 - 0.4 ppm
	LEL	5370	28	2.80%	2.5 - 3.2 %
	SO_2	5370	6	0.1 ppm	0.1 - 0.1 ppm
	VOC	5370	63	0.1 ppm	0.1 - 0.2 ppm
Unit 03	H_2S	4772	137	0.1 ppm	0.1 - 0.2 ppm
	LEL	4772	0	NA	< 1 %
	SO_2	4772	1	0.1 ppm	0.1 - 0.1 ppm
	VOC	4772	179	0.1 ppm	0.1 - 0.1 ppm
Unit 04	H_2S	5367	353	0.2 ppm	0.1 - 0.6 ppm
	LEL	5367	0	NA	< 1 %
	SO_2	5367	0	NA	< 0.1 ppm
	VOC	5367	109	0.1 ppm	0.1 - 0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 3: Data-logged AM510 Particulate (PM_{10}) Monitoring Summary[1]
November 27, 2014 07:00 – November 28, 2014 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10408088	AR01	4749	4749	0.009	0.001 - 0.326 mg/m^3
10704074	AR02	4891	4553	0.006	0.001 - 0.275 mg/m^3
10704072	AR03	5017	3590	0.012	0.001 - 0.511 mg/m^3
10408087	AR04	3922	3922	0.280	0.106 - 0.759 mg/m^3

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*

Appendix A

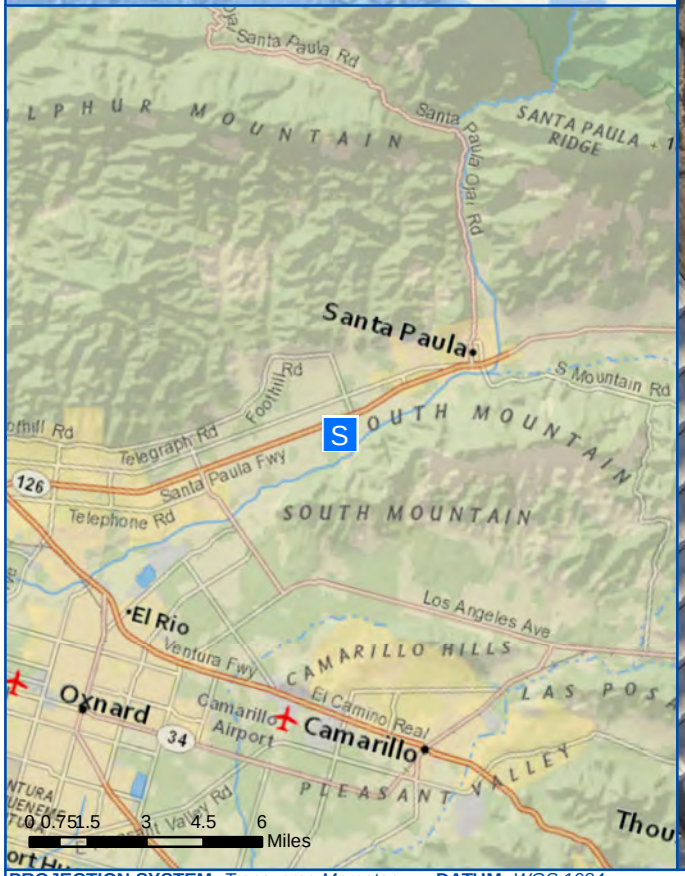
Incident Maps:

Real-time Air Monitoring Locations and Incident Site

Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/25/2014 9:42:14 AM*

Aerial Overview - 11/27/2014

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/28/2014 12:07:39 PM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2SO_4 - Nov 27, 2014 07:00 to Nov 28, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/28/2014 8:02:11 AM*

Manually Logged Real-Time Air Monitoring Concentrations

SO_2 - Nov 27, 2014 07:00 to Nov 28, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *11/28/2014 7:59:14 AM*

Manually Logged Real-Time Air Monitoring Concentrations

PM_{10} - Nov 27, 2014 07:00 to Nov 28, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *11/28/2014 8:03:21 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Peroxides - Nov 27, 2014 07:00 to Nov 28, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/28/2014 7:53:22 AM*

Manually Logged Real-Time Air Monitoring Concentrations

O_2 - Nov 27, 2014 07:00 to Nov 28, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *11/28/2014 7:54:12 AM*

Manually Logged Real-Time Air Monitoring Concentrations

LEL - Nov 27, 2014 07:00 to Nov 28, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/28/2014 7:52:42 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2S - Nov 27, 2014 07:00 to Nov 28, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *11/28/2014 7:58:35 AM*

Manually Logged Real-Time Air Monitoring Concentrations

CO - Nov 27, 2014 07:00 to Nov 28, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *11/28/2014 8:04:24 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Cl_2 - Nov 27, 2014 07:00 to Nov 28, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84* Print Date: *11/28/2014 7:56:15 AM*

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and AreaRAE/AM510 Air Monitoring Location Map

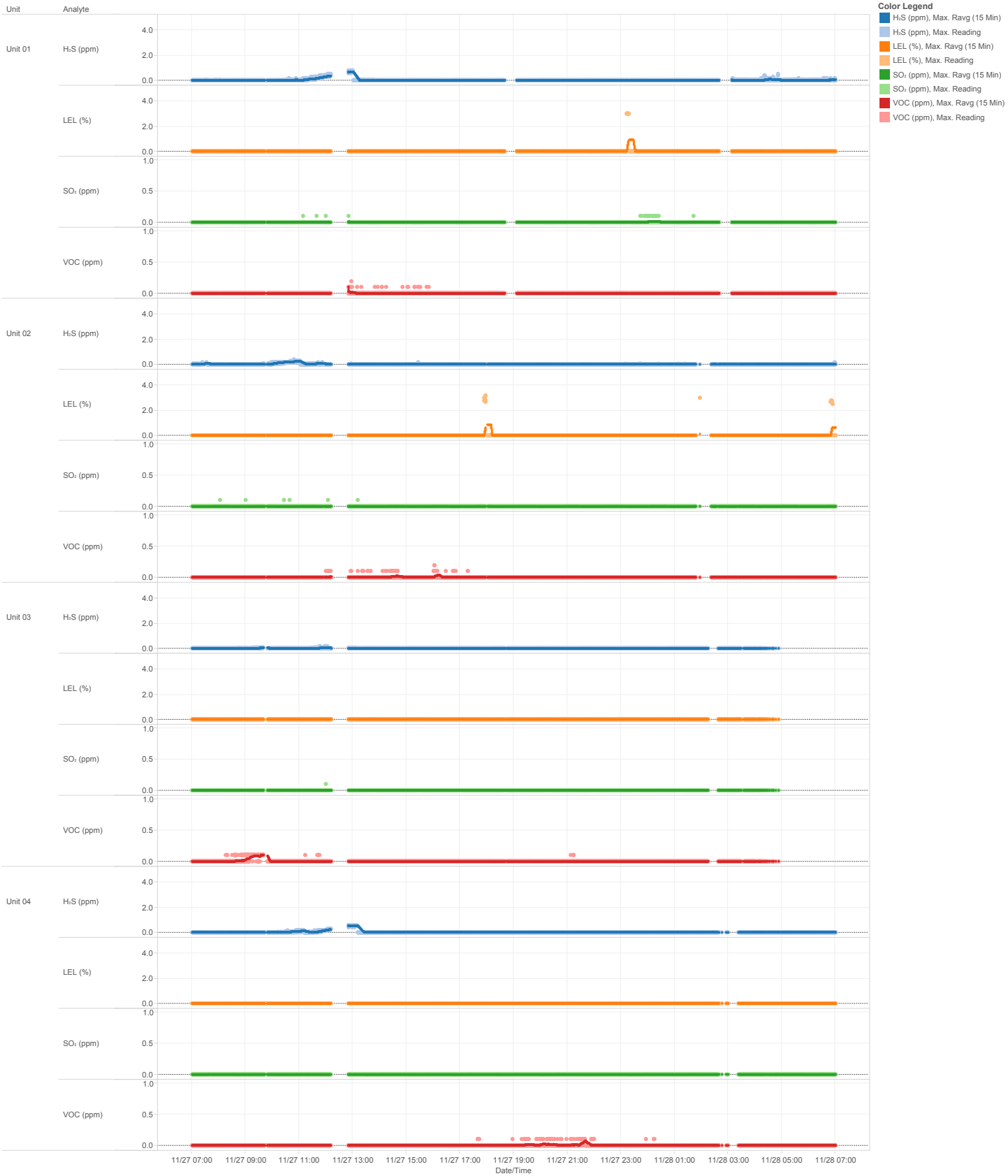
AreaRAE and AM510 Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/26/2014 11:37:30 AM*

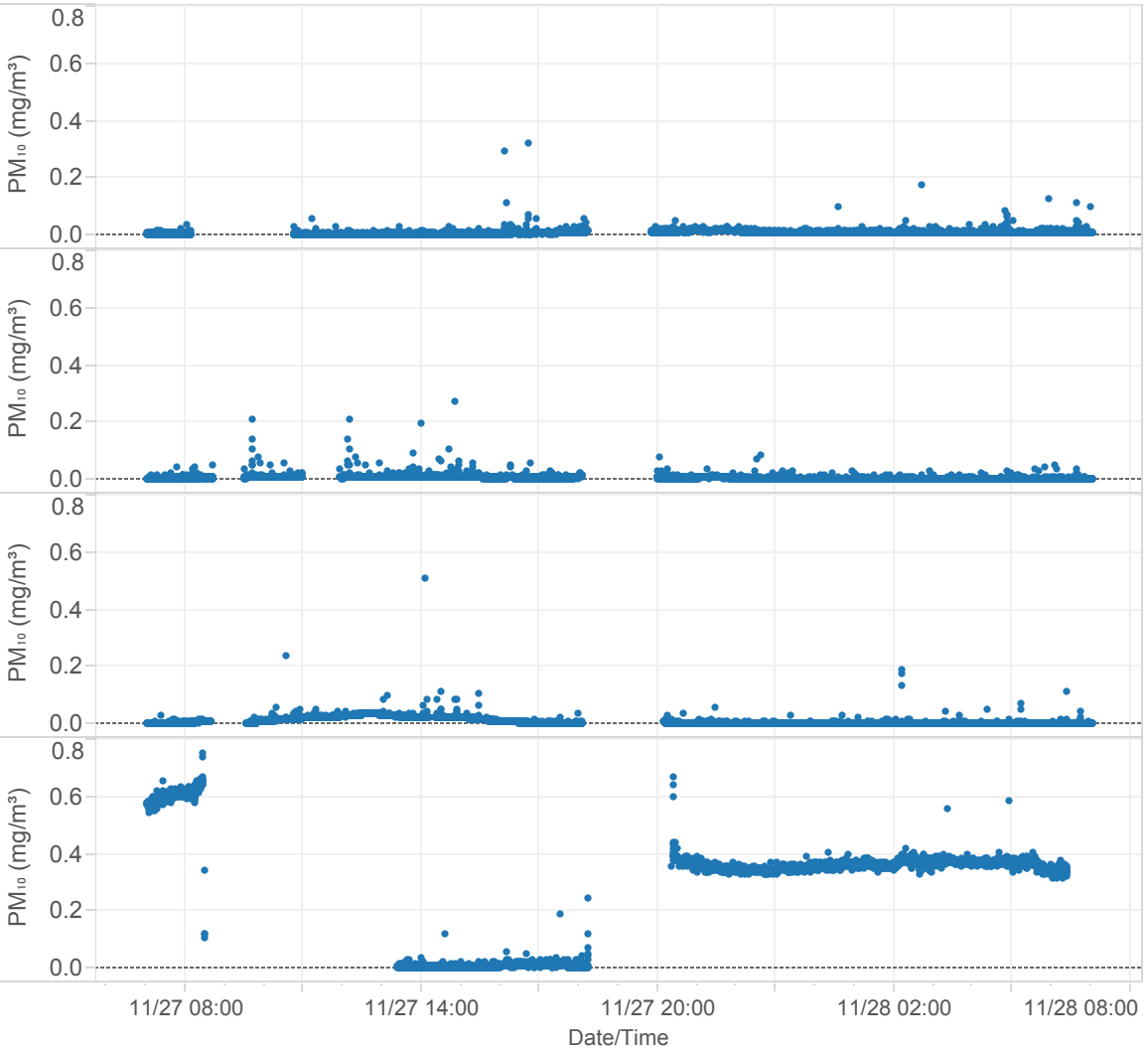
Patriot Environmental
AreaRAE Trend Graphs
11/27/2014 07:00 - 11/28/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM_{10}) Summary
11/27/2014 07:00 - 11/28/2014 07:00

Location	Serial No
AR01	10408088
AR02	10704074
AR03	10704072
AR04	10408087



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format